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Impacts of the Rapid Expansion in Corn-Based Ethanol Production on Crop Acreage Needs, Grain Prices, Basis Behaivor, and Implications for Corn Users

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Corn processors have been producing fuel ethanol for more than two decades, but several important events have generated an unprecedented expansion in the industry in the last two years. The combination of events included:

- Record-high crude petroleum prices in late 2005 and the first two-thirds of 2006
- The 2005 energy bill that mandated 7.5 billion bushels of renewable fuels production by 2012,
- The $0.51 per gallon blending credit
- Strong support for renewable fuels from both major political parties
- Widespread desire for dependable domestic energy supplies
- Financial assistance from local communities seeking job growth
- Low corn prices

These events and recent very large returns to new ethanol plants led to strong local and outside investment in construction of ethanol plants in the past 15 months. At this writing, there are 25 corn processing plants operating in Iowa (the No. 1 corn-producing state), with total rated corn processing capacity for all purposes of approximately 980 million bushels per year. That is equivalent to 47 percent of the estimated 2006 Iowa corn crop. In addition, plants being expanded and new plants under construction in the state have rated capacities totaling nearly 430 million bushels of corn processing capacity. *These plants will bring rated capacity to the equivalent of 68% of the current Iowa corn crop.* It should be noted that rated capacity understates actual processing capacity. Most plants can operate at 20 percent above rated capacity. Another 1.16 billion bushels of rated corn processing capacity are in various planning stages in Iowa, ranging from initial proposals to the approach of ground breaking. *If all of these plants are built, corn processing capacity in the state will be equivalent to 124% of the current Iowa corn crop.* A large amount of corn currently is fed in Iowa along with substantial corn exports to other states and foreign markets. To maintain these other uses and supply planned plants in the next few years, Iowa corn acreage likely will need to be expanded by about 65%.

Nationally, about 20% of the U.S. corn crop is expected to be processed into ethanol this marketing year. With the rapid growth of corn processing for ethanol, the 2006 corn crop is approximately 1.15 billion bushels below potential market demand, and that is with the second highest U.S. corn yield per acre on record. Another 1.7 billion bushels of plant capacity are in construction or expansion phases. In the last year, the average time for completion of similar projects has been 12 months. Because the engineering, equipment supplier, and construction industries are operating at peak capacity, average construction time for current plants may be a bit longer. Even so, most plants currently being built should be operating in 15-18 months. That will push the potential production-use short-fall to around 2.8 billion bushels (26% of the

current U.S. crop), barring a sharp decline in other uses of corn.

Operating and currently planned plants would push total U.S. ethanol processing capacity to around 10.1 billion bushels of corn. This year's U.S. corn crop is estimated at 10.7 billion bushels, so it is clear that (1) a very large increase in corn plantings will be needed in the next few years, (2) market forces will at some point cause some planned plants to be abandoned, (3) prices for corn and corn products will be much higher and much more volatile than in recent years, and (4) risk management will become extremely important for users of corn and corn products. The U.S. total cropland base has been in a slight long-term downward trend, and much of the Conservation Reserve Program land is not suitable for corn. Accordingly, increased production will need to come from shifts of cropland from other crops to corn.